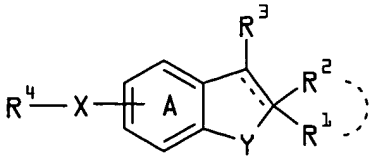
1. (THRICE AMENDED) A compound of the formula:



wherein R^1 and R^2 each represent an acyclic hydrocarbon group, a cycloalkyl group, or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered substituted or unsubstituted carbo or heterocyclic ring;

R^3 represents an unsubstituted or substituted aromatic group;

R^4 represents (1) an unsubstituted or substituted aromatic group, (2) an aliphatic hydrocarbon group substituted by an unsubstituted or substituted aromatic group, which hydrocarbon group is optionally further substituted or (3) an acyl;

X and Y each represent an oxygen atom;

---- represents a single bond or a double bond; and

ring A represents a benzene ring optionally further substituted apart from the group of the formula: -X-R^4 wherein each symbol is as defined above,

provided that when ---- is a single bond, R^4 is not an acyl,

or a salt thereof.

2. (TWICE AMENDED) A compound of Claim 1,

wherein R^1 and R^2 each is a C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl or R^1 and R^2 form, taken together with the adjacent carbon atom, a C_{3-8} cycloalkane or a 3- to 8-membered heterocyclic ring, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl, C_{7-16}

aralkyl, amino, mono-C_{1-6} alkylamino, mono-C_{6-14} arylamino, di-C_{1-6} alkylamino, di-C_{6-14} arylamino and 5- to 10-membered aromatic heterocyclic group;

R^3 is a C_{6-14} aryl or a 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms,

each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-3} alkylenedioxy,

(3) nitro,

(4) cyano,

(5) halogenated or unhalogenated C_{1-6} alkyl,

(6) halogenated or unhalogenated C_{2-6} alkenyl,

(7) halogenated or unhalogenated C_{2-6} alkynyl,

(8) halogenated or unhalogenated C_{3-6} cycloalkyl,

(9) halogenated or unhalogenated C_{1-6} alkoxy,

(10) halogenated or unhalogenated C_{1-6} alkylthio,

(11) hydroxy,

(12) amino,

(13) mono-C_{1-6} alkylamino,

(14) di-C_{1-6} alkylamino,

(15) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

(19) sulfo,

(20) C_{6-14} aryl and

(21) C_{6-14} aryloxy;

R^4 is (i) a C_{6-14} aryl or a 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms,

each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-3} alkylenedioxy,

(3) nitro,

(4) cyano,

(5) halogenated or unhalogenated C_{1-6} alkyl,

(6) halogenated or unhalogenated C_{2-6} alkenyl,

(7) halogenated or unhalogenated C_{2-6} alkynyl,

(8) halogenated or unhalogenated C_{3-6} cycloalkyl,

(9) halogenated or unhalogenated C_{1-6} alkoxy,

(10) halogenated or unhalogenated C_{1-6} alkylthio,

(11) hydroxy,

(12) amino,

(13) mono-C_{1-6} alkylamino,

(14) di-C_{1-6} alkylamino,

(15) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6}

alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

(19) sulfo,

(20) C_{6-14} aryl and

(21) C_{6-14} aryloxy,

(ii) an aliphatic hydrocarbon group selected form the group consisting of C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl and C_{3-6} cycloalkyl,

which hydrocarbon group substituted by 1 to 3 C_{6-14} aryl or 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms,

each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-3} alkylenedioxy,

(3) nitro,

(4) cyano,

(5) halogenated or unhalogenated C_{1-6} alkyl,

(6) halogenated or unhalogenated C_{2-6} alkenyl,

(7) halogenated or unhalogenated C_{2-6} alkynyl,

(8) halogenated or unhalogenated C_{3-6} cycloalkyl,

(9) halogenated or unhalogenated C_{1-6} alkoxy,

(10) halogenated or unhalogenated C_{1-6} alkylthio,

(11) hydroxy,

(12) amino,

(13) mono-C_{1-6} alkylamino,

(14) di-C_{1-6} alkylamino,

(15) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle

carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

E1

(19) sulfo,

(20) C_{6-14} aryl and

(21) C_{6-14} aryloxy,

which hydrocarbon group are optionally further substituted by 1 to 5 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-3} alkylenedioxy,

(3) nitro,

(4) cyano,

(5) halogenated or unhalogenated C_{1-6} alkyl,

(6) halogenated or unhalogenated C_{2-6} alkenyl,

(7) halogenated or unhalogenated C_{2-6} alkynyl,

(8) halogenated or unhalogenated C_{3-6} cycloalkyl,

(9) C_{6-14} aryl,

(10) halogenated or unhalogenated C_{1-6} alkoxy,

(11) halogenated or unhalogenated C_{1-6} alkylthio,

(12) hydroxy,

(13) amino,

(14) mono-C_{1-6} alkylamino,

(15) mono-C_{6-14} arylamino,

(16) di-C_{1-6} alkylamino,

(17) di-C_{6-14} arylamino,

(18) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(19) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(20) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

(21) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(22) 5- to 10-membered aromatic heterocyclic group and

(23) sulfo, or

(iii) an acyl of the formula: $-(C=O)-R^5$, $-(C=O)-OR^5$, $-(C=O)-NR^5R^6$, $-(C=S)-NHR^5$, $-SO_2-R^{5a}$ or $-SO-R^{5a}$

wherein R^5 is

(a) a hydrogen atom,

(b) a C_{6-14} aryl or a 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-3} alkylenedioxy,

(3) nitro,

(4) cyano,

(5) halogenated or unhalogenated C_{1-6} alkyl,

(6) halogenated or unhalogenated C_{2-6} alkenyl,

(7) halogenated or unhalogenated C_{2-6} alkynyl,

(8) halogenated or unhalogenated C_{3-6} cycloalkyl,

(9) halogenated or unhalogenated C_{1-6} alkoxy,

(10) halogenated or unhalogenated C_{1-6} alkylthio,

(11) hydroxy,

(12) amino,

(13) mono-C_{1-6} alkylamino,

(14) di-C_{1-6} alkylamino,

(15) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl,

C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

(19) sulfo,

(20) C_{6-14} aryl and

(21) C_{6-14} aryloxy, or

(c) a C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl or C_{3-6} cycloalkyl unsubstituted or substituted group; said substituted group substituted by 1 to 5 substituents selected from the group consisting of

(1) C_{6-14} aryl or 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms,

each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1') halogen atoms,

(2') C_{1-3} alkylenedioxy,

(3') nitro,

(4') cyano,

(5') halogenated or unhalogenated C_{1-6} alkyl,

(6') halogenated or unhalogenated C_{2-6} alkenyl,

(7') halogenated or unhalogenated C_{2-6} alkynyl,

(8') halogenated or unhalogenated C_{3-6} cycloalkyl,

(9') halogenated or unhalogenated C_{1-6} alkoxy,

(10') halogenated or unhalogenated C_{1-6} alkylthio,

(11') hydroxy,

(12') amino,

(13') mono-C_{1-6} alkylamino,

(14') di-C_{1-6} alkylamino,

(15') 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino

substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(16') acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(17') acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6}

alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(18') acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

(19') sulfo,

(20') C_{6-14} aryl and

(21') C_{6-14} aryloxy,

(2) halogen atoms,

(3) C_{1-3} alkylenedioxy,

(4) nitro,

(5) cyano,

(6) halogenated or unhalogenated C_{1-6} alkyl,

(7) halogenated or unhalogenated C_{2-6} alkenyl,

(8) halogenated or unhalogenated C_{2-6} alkynyl,

(9) halogenated or unhalogenated C_{3-6} cycloalkyl,

(10) halogenated or unhalogenated C_{1-6} alkoxy,

(11) halogenated or unhalogenated C_{1-6} alkylthio,

(12) hydroxy,

(13) amino,

(14) mono-C_{1-6} alkylamino,

(15) di-C_{1-6} alkylamino,

(16) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(17) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(18) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(19) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy and

(20) sulfo;

R^{5a} is

(a) a C_{6-14} aryl or a 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-3} alkylenedioxy,

(3) nitro,

(4) cyano,

(5) halogenated or unhalogenated C_{1-6} alkyl,

(6) halogenated or unhalogenated C_{2-6} alkenyl,

(7) halogenated or unhalogenated C_{2-6} alkynyl,

(8) halogenated or unhalogenated C_{3-6} cycloalkyl,

(9) halogenated or unhalogenated C_{1-6} alkoxy,

(10) halogenated or unhalogenated C_{1-6} alkylthio,

(11) hydroxy,

(12) amino,

(13) mono-C_{1-6} alkylamino,

(14) di-C_{1-6} alkylamino,

(15) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-

carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

(19) sulfo,

(20) C_{6-14} aryl and

(21) C_{6-14} aryloxy, or

(b) a C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl or C_{3-6} cycloalkyl group optionally substituted by 1 to 5 substituents selected from the group consisting of

(1) a C_{6-14} aryl or 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1') halogen atoms,

(2') C_{1-3} alkylenedioxy,

(3') nitro,

(4') cyano,

(5') halogenated or unhalogenated C_{1-6} alkyl,

(6') halogenated or unhalogenated C_{2-6} alkenyl,

(7') halogenated or unhalogenated C_{2-6} alkynyl,

(8') halogenated or unhalogenated C_{3-6} cycloalkyl,

(9') halogenated or unhalogenated C_{1-6} alkoxy,

(10') halogenated or unhalogenated C_{1-6} alkylthio,

(11') hydroxy,

(12') amino,

(13') mono-C_{1-6} alkylamino,

(14') di-C_{1-6} alkylamino,

(15') 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(16') acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6}

alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(17') acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(18') acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-

carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

(19') sulfo,

(20') C_{6-14} aryl and

(21') C_{6-14} aryloxy,

(2) halogen atoms,

(3) C_{1-3} alkylenedioxy,

(4) nitro,

(5) cyano,

(6) halogenated or unhalogenated C_{1-6} alkyl,

(7) halogenated or unhalogenated C_{2-6} alkenyl,

(8) halogenated or unhalogenated C_{2-6} alkynyl,

(9) halogenated or unhalogenated C_{3-6} cycloalkyl,

(10) halogenated or unhalogenated C_{1-6} alkoxy,

(11) halogenated or unhalogenated C_{1-6} alkylthio,

(12) hydroxy,

(13) amino,

(14) mono-C_{1-6} alkylamino,

(15) di-C_{1-6} alkylamino,

(16) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(17) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(18) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(19) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy and

(20) sulfo; and

R^6 is a hydrogen atom or a C_{1-6} alkyl; and

ring A is a benzene ring optionally further substituted by 1 to 3 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-3} alkylenedioxy,

(3) nitro,

(4) cyano,

(5) halogenated or unhalogenated C_{1-6} alkyl,

(6) halogenated or unhalogenated C_{2-6} alkenyl,

(7) halogenated or unhalogenated C_{2-6} alkynyl,

(8) halogenated or unhalogenated C_{3-6} cycloalkyl,

(9) halogenated or unhalogenatedC_{1-6} alkoxy,

(10) halogenated or unhalogenated C_{1-6} alkylthio,

(11) hydroxy,

(12) amino,

(13) mono-C_{1-6} alkylamino,

(14) di-C_{1-6} alkylamino,

(15) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group,

(16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-

carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl,

(17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino,

(18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy,

(19) sulfo,

(20) C_{6-14} aryl and

(21) C_{6-14} aryloxy.

E1

3. (TWICE AMENDED) A compound of Claim 1, wherein R^1 and R^2 each is a C_{1-6} alkyl or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic unsubstituted or substituted ring.

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5. (AMENDED) A compound of Claim 1, wherein R^4 is (i) an aliphatic hydrocarbon group substituted by an unsubstituted or substituted aromatic group, which hydrocarbon group is optionally further substituted or (ii) an acyl.

E3

10. (TWICE AMENDED) A compound of Claim 1,

wherein R^1 and R^2 each is a C_{1-6} alkyl or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic unsubstituted or

substituted ring; said substituted ring substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl, C_{7-16} aralkyl and 5- to 10-membered aromatic heterocyclic group;

R^3 is a phenyl, 1-naphthyl, 2-naphthyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-quinolyl, 3-quinolyl, 1-isoquinolyl, 1-indolyl, 2-indolyl or 2-benzothiazolyl group, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-6} alkyl,

(3) C_{1-6} alkoxy,

(4) mono-C_{1-6} alkylamino,

(5) di-C_{1-6} alkylamino and

(6) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic group;

R^4 is

(i) C_{1-6} alkyl substituted by a phenyl, 1-naphthyl, 2-naphthyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-quinolyl, 3-quinolyl, 1-isoquinolyl, 1-indolyl, 2-indolyl or 2-benzothiazolyl group, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of

(1) halogen atoms,

(2) C_{1-6} alkyl,

(3) C_{1-6} alkoxy,

(4) hydroxy,

(5) amino,

(6) mono-C_{1-6} alkylamino,

(7) di-C_{1-6} alkylamino,

(8) carboxy and

(9) 5- to 7-membered saturated unsubstituted or substituted cyclic amino; said substituted cyclic amino substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic group, which C_{1-6} alkyl is optionally further substituted by carboxy or C_{1-6} alkoxy-carbonyl, or

(ii) a C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{6-14} aryl-carbonyl or C_{7-16} aralkyl-carbonyl group, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, amino, mono-C_{1-6} alkylamino, di-C_{1-6} alkylamino and carboxy;

X is an oxygen atom;

Y is an oxygen atom; and

ring A is a benzene ring which is optionally further substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, halogenated or unhalogenated C_{1-6} alkyl, halogenated or unhalogenated C_{1-6} alkoxy, amino, mono-C_{1-6} alkylamino and di-C_{1-6} alkylamino.

11. (TWICE AMENDED) A compound of Claim 1,

wherein R^1 and R^2 each is a C_{1-6} alkyl or R^1 and R^2 form, taken together with the adjacent carbon atom, a piperidine optionally substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and C_{7-16} aralkyl;

R^3 is a phenyl optionally substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_{1-6} alkyl, C_{1-6} alkoxy, amino, mono-C_{1-6} alkylamino and di-C_{1-6} alkylamino;

R^4 is

(i) C_{1-6} alkyl substituted by a phenyl or pyridyl, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, amino, mono-C_{1-6} alkylamino, di-C_{1-6} alkylamino and carboxy, or

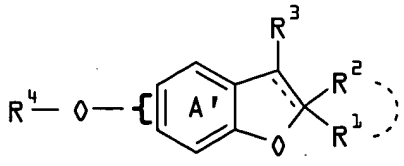
(ii) an acyl of the formula: -(C=O)-$R^{5'}$ wherein $R^{5'}$ is a phenyl or phenyl-C_{1-6} alkyl, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, amino, mono-C_{1-6} alkylamino, di-C_{1-6} alkylamino and carboxy;

X is an oxygen atom;

Y is an oxygen atom; and

ring A is a benzene ring which is optionally further substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, halogenated or unhalogenated C_{1-6} alkyl, halogenated or unhalogenated C_{1-6} alkoxy, amino, mono-C_{1-6} alkylamino and di-C_{1-6} alkylamino.

12. (TWICE AMENDED) A compound of Claim 1 which is a compound of the formula:



wherein R^1 and R^2 each is C_{1-6} alkyl or R^1 and R^2 form, taken together with the adjacent carbon atom, a piperidine substituted by a C_{1-6} alkyl or a C_{7-16} aralkyl;

R^3 is a phenyl optionally substituted by 1 to 3 substituents selected from the group consisting of (1) C_{1-6} alkyl, (2) di-C_{1-6} alkylamino and (3) 6-membered saturated cyclic amino optionally substituted by a C_{1-6} alkyl,

R^4 is

(i)a phenyl optionally substituted by 1 to 3 substituents selected from the group consisting of nitro and C_{1-6} alkyl-carboxamido,

(ii) a C_{1-6} alkyl or C_{2-6} alkenyl group substituted by 1 to 3 of phenyl, quinolyl or pyridyl, each of which is optionally substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-6} alkoxy-carbonyl, C_{1-6} alkylsulfonyl and C_{1-6} alkylsulfinyl, which C_{1-6} alkyl or C_{2-6} alkenyl group is optionally further substituted by a phenyl, carboxy or C_{1-6} alkoxy-carbonyl, or

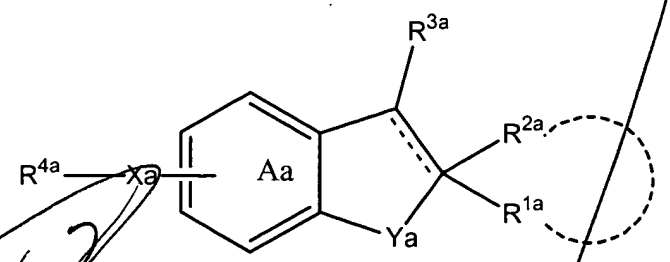
(iii) an acyl of the formula: $-(C=O)-R^{5''}$

wherein $R^{5''}$ is phenyl substituted by a C_{1-6} alkoxy; and

ring A' is a benzene ring which is optionally further substituted by 1 to 3 C_{1-6} alkyl.

13. (TWICE AMENDED) A compound of Claim 1 which is 3-(4-isopropylphenyl)-2,4,6,7-tetramethylbenzofuran-5-yl 4-methoxybenzoate, 3-(4-isopropylphenyl)-5-(4-methoxybenzyloxy)-2,4,6,7-tetramethylbenzofuran, 3-(4-isopropylphenyl)-5-(4-methoxybenzyloxy)-1',4,6,7-tetramethylspiro(benzofuran-2(3H), 4'-piperidine), or a salt thereof.

22. (FOUR TIMES AMENDED) A method for suppressing β-amyloid toxicity in a mammal, which comprises administering to said mammal an effective amount of a compound of the formula:



wherein R^{1a} and R^{2a} each represents a hydrogen atom or a hydrocarbon group which is optionally substituted, or R^{1a} and R^{2a} form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic unsubstituted or substituted ring;

R^{3a} represents a hydrogen atom or an unsubstituted or substituted aromatic group;

R^{4a} represents an unsubstituted or substituted aromatic group, an unsubstituted or substituted aliphatic hydrocarbon group or an acyl;

Xa represents an oxygen atom;

Ya represents an oxygen atom;

---- represents a single bond or a double bond;

ring Aa represents a benzene ring which is optionally further substituted apart from (i) the group of the formula: -Xa-R^{4a} wherein each symbol is as defined above, and (ii) an unsubstituted or substituted amino,

provided that when ---- is a single bond, R^{4a} is not an acyl,

or a pharmaceutically acceptable salt thereof

with a pharmaceutically acceptable excipient, carrier or diluent.

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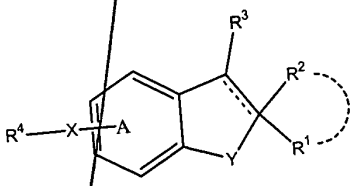
25. (TWICE AMENDED) A method for suppressing β-amyloid toxicity in a mammal, which comprises administering to said mammal an effective amount of a compound of the formula:



wherein R^1 and R^2 each represent an acyclic hydrocarbon group, a cycloalkyl group, or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic unsubstituted or substituted ring;

R^3 represents an unsubstituted or substituted aromatic group;

R^4 represents (1) an unsubstituted or substituted aromatic group, (2) an aliphatic hydrocarbon group substituted by an unsubstituted or substituted aromatic group, which hydrocarbon group is optionally further substituted or (3) an acyl;

X and Y each represent an oxygen atom;

------- represents a single bond or a double bond;

and Ring A represents a benzene which is optionally further substituted apart from the group of the formula: $-X-R^4$ wherein each symbol is as defined above,

provided that when ------- is a single bond, R^4 is not an acyl,

or a salt thereof

with a pharmaceutically acceptable excipient, carrier or diluent.

26. (TWICE AMENDED) A method of claim 25, which is a method for treating Alzheimer's disease.

28. (TWICE AMEMDED) A method of claim 22, which is a method for treating Alzheimer's disease.

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